ToxIC Fentalog Study Group — Quarterly NPS Report

CLINICAL | **Q3 2023**

PURPOSE: This report provides new information regarding comprehensive drug testing of clinical toxicology specimens collected after suspected opioid overdoses in cities across the United States (U.S.).

OVERVIEW: Drug use can lead to adverse events and overdose scenarios where individuals present to emergency departments (EDs) for clinical evaluation and/or treatment. The culprit can be traditional drugs (e.g., heroin, fentanyl, cocaine, methamphetamine) or novel psychoactive substances (NPS); however, proper drug testing methodologies must be used for accurate identification and characterization. Street-level drug preparations can contain undeclared or unwanted substances (e.g., toxic adulterants or NPS) which can potentiate effects or lead to adverse reactions. Understanding emerging drug trends and drug testing results can help direct new or revised approaches to clinical treatment and harm reduction.

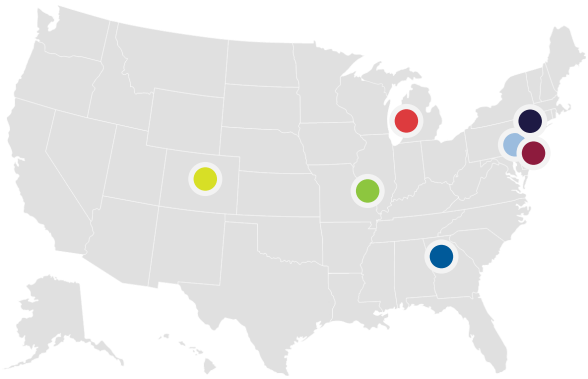
OBJECTIVE: A partnership between the American College of Medical Toxicology (ACMT) and the Center for Forensic Science Research and Education (CFSRE) was established to comprehensively assess the role and prevalence of synthetic opioids and other drugs among suspected overdose events in the U.S.

SAMPLE SOURCE: Patients presented to EDs within ACMT's Toxicology Investigators Consortium (ToxIC) experiencing a suspected opioid overdose. Residual, discarded biological samples were obtained for testing against an expansive library of drugs and other substances. Our findings provide a near real-time assessment of the drug market and allude to resulting implications on clinical institutions.

TOXICOLOGY TESTING: Analysis was performed via liquid chromatography quadrupole time-of-flight mass spectrometry (LC-QTOF-MS). The scope of testing targeted more than 1,200 drugs, including a vast majority of NPS and metabolites. Drug classes included opioids, benzodiazepines, cannabinoids, stimulants, and hallucinogens, among other drugs.

ACKNOWLEDGEMENTS: This report was prepared by Alex Manini, Sara Walton, Alex Krotulski, Paul Wax, Jeffery Brent, Kim Aldy, Rachael Culbreth, Sharan Campleman, Alyssa Falise, Joseph Carpenter, Alexandra Amaducci, Jennie Buchanan, Bryan Judge, Michael Levine, Evan Schwarz, Diane Calello, Christopher Meaden, Joshua Shulman, Robert Hendrickson, Adrienne Hughes, Brianna Stang, Alyssa Reyes, and Barry Logan. The authors acknowledge ACMT personnel, ToxIC investigators, and CFSRE staff for their contributions. Funding was received from the National Institute on Drug Abuse (NIDA) of the National Institutes of Health (NIH), Award Number: R01DA048009. Supplemental funding to increase the project's testing capacity was provided by the Centers for Disease Control and Prevention (CDC), Award Number: 3R01DA048009-04S1. The opinions, findings, conclusions and/or recommendations expressed in this publication are those of the authors and do not necessarily reflect those of NIDA, NIH, CDC, or other agencies. For more information, contact npsdiscovery@cfsre.org or visit www.npsdiscovery.org.

SUGGESTED CITATION: Manini et al. (2024) ToxIC *Fentalog Study Group — Quarterly NPS Report Q3 2023*, Center for Forensic Science Research and Education, United States.



ATLANTA, GA (N=17)

- 88% positive for at least one opioid
- Fentanyl (76%) most commonly detected, followed by methadone (6%) & heroin (6%)
- Opioid and stimulant use (29%) and opioid and benzodiazepine use (12%) observed
- **NPS opioids and NPS stimulants detected in combination (6%)**
- **NPS: *p*-Fluorofentanyl (6%), Metonitazene (6%), Eutylone (6%), Clonazolam (6%), Flualprazolam (6%)**

NEWARK, NJ (N=24)

- 67% positive for at least one opioid
- Fentanyl (67%) identified in all opioid positive samples
- Xylazine detected alongside fentanyl (13%)
- Opioid and stimulant use (17%) and opioid and benzodiazepine use (13%) observed
- **NPS: *p*-Fluorofentanyl (4%)**

DENVER, CO (N=84)

- 89% positive for at least one opioid
- Fentanyl (79%) commonly detected, followed by oxycodone (8%) and methadone (6%)
- Opioid and stimulant use common (70%); opioid and benzodiazepine use less common (19%)
- THC and metabolites detected (8%)
- *Note: Xylazine not detected in fentanyl positive samples*
- **NPS: *p*-Fluorofentanyl (2%), Bromazolam (2%), Flubromazepam (1%)**

ST. LOUIS, MO (N=27)

- 96% positive for at least one opioid
- Fentanyl (96%) identified in all opioid positive samples; tramadol detected (15%)
- Xylazine detected alongside fentanyl (37%)
- Opioid and stimulant use common (70%); opioid and benzodiazepine use less common (4%)
- **NPS commonly observed in combination with other NPS (12%)**
- **NPS: *p*-Fluorofentanyl (22%), Bromazolam (15%), Etizolam (15%), Clonazolam (8%), Phenazolam (4%), *N,N*-Dimethylpentylone (4%), *N*-Pyrrolidino Etonitazene (4%), Desalkylflurazepam (4%)**

ALLENTOWN, PA (N=10)

- 80% positive for at least one opioid
- Fentanyl (60%) commonly detected, followed by tramadol (20%)
- Xylazine detected alongside fentanyl (33%)
- Opioid and stimulant use (30%) and opioid and benzodiazepine use (10%) observed
- *No NPS detected*

GRAND RAPIDS, MI (N=17)

- 82% positive for at least one opioid
- Fentanyl (70%) most commonly detected, followed by methadone (11%) and oxycodone (6%)
- Xylazine detected alongside fentanyl (11%)
- Opioid and stimulant use (35%) and opioid and benzodiazepine use (11%) observed
- THC and metabolites detected (23%)
- **NPS: *p*-Fluorofentanyl (11%), Bromazolam (6%), *N*-Pyrrolidino Protonitazene (6%)**

NEW YORK, NY (N=87)

- 87% positive for at least one opioid
- Fentanyl (83%) most commonly detected, followed by methadone (18%), tramadol (6%), and oxycodone (6%)
- Xylazine detected alongside fentanyl (18%)
- Opioid and stimulant use (67%) and opioid and benzodiazepine use (27%) observed
- **NPS: *p*-Fluorofentanyl (3%), Bromazolam (7%), Flubromazepam (2%), MDMB-4en-PINACA (2%)**

cfsre | NPS DISCOVERY

ACMT American College of Medical Toxicology

ToxIC Toxicology Investigators Consortium